Felipe W. Trevizan

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Education

Ph.D., Machine Learning, Carnegie Mellon University, August 2013
Thesis title: Short-Sighted Planning under Uncertainty
Advisor: Manuela Veloso

M.S., Machine Learning, Carnegie Mellon University, 2010
Dissertation title: Learning Opponent's Strategies in the RoboCup Small-Size League
Advisor: Manuela Veloso

M.S., Computer Science, São Paulo University, 2006
Dissertation title: An Unified Model for Planning under Uncertainty
Advisor: Leliane Nunes de Barros

B.S., Computer Science, São Paulo University, 2004
Dissertation title: Cognitive Robotics: an Application of Planning with Incomplete Information
Advisor: Leliane Nunes de Barros

Publications

Refereed Journals Papers

Guilliard, I., Sanner, S., Trevizan, F. W., and Williams, B. (2016). A Non-homogeneous Time Mixed Integer LP Formulation for Traffic Signal Control. *Transport Research Record (TRR): Journal of the Transport Research Board*, to appear.

Santos, F. M., Barros, L. N., Trevizan, F. W. (2015). Reachability-based Model Reduction for Markov Decision Process. *Journal of the Brazilian Computer Society*, 21:1–16.

Trevizan, F. W., Veloso, M. M. (2014). Depth-based Short-Sighted Stochastic Shortest Path Problems. *Artificial Intelligence*, 216:179–205

Trevizan, F. W., Barros, L. N. (2007). Robótica Cognitiva: programação baseada em lógica para controle de robôs. *Controle & Automação*, 18:187–198.

Trevizan, F. W., Barros, L. N., and da Silva, F. S. C. (2006). Designing Logic-based Robots. *Inteligencia Artificial, Revista Iberoamericana de Inteligencia Artificial*, 10(31):11–22.

Refereed Conferences Papers

Trevizan, F. W., Thiébaux, S., Santana, P., and Williams, B. (2016). Heuristic Search in Dual Space for Constrained Stochastic Shortest Path Problems. In *Proceedings of 26th International Conference on Automated Planning and Scheduling (ICAPS'16)*. **(Winner of the Best Paper Award)**

Trevizan, F. W. and Veloso, M. M. (2013). Finding Objects through Stochastic Shortest Path Problems. In *Proceedings of 12nd International Conference on Autonomous Agents and Multiagent Systems (AAMAS'13)*.

Trevizan, F. W. and Veloso, M. M. (2012). Trajectory-Based Short-Sighted Probabilistic Planning.

In *Proceedings of Advances in Neural Information Processing Systems (NIPS'12)*.

Trevizan, F. W. and Veloso, M. M. (2012). Short-Sighted Stochastic Shortest Path Problems. In *Proceedings of 22nd International Joint Conference on Automated Planning and Scheduling (ICAPS'12)*.

Shirota Filho, R., Cozman, F. G., Trevizan, F. W., de Campos, C. P., and de Barros, L. N. (2007). Multilinear and Integer Programming for Markov Decision Processes with Imprecise Probabilities In *Proceedings of the 5th International Symposium On Imprecise Probability: Theories And Applications (ISIPTA'07)*.

Trevizan, F. W., Cozman, F. G., and de Barros, L. N. (2007). Planning under Risk and Knightian Uncertainty. In *Proceedings of the 20th International Joint Conference on Artificial Intelligence (IJCAI'07)*, pages 2023 – 2028, Hyderabad, India.

Trevizan, F. W., Cozman, F. G., and de Barros, L. N. (2006). Unifying Nondeterministic and Probabilistic Planning through Imprecise Markov Decision Processes. In *Proceedings of the 2nd International Joint Conference, 10th Ibero-American Conference on AI (IBERAMIA'06), 18th Brazilian AI Symposium (SBIA'06)*, volume 4140 of *Lecture Notes in Computer Science*, pages 502–511, Ribeirão Preto, SP, Brazil. Springer-Verlag. **(Winner of the Best Paper Award)**.

Trevizan, F. W., Barros, L. N., and da Silva, F. S. C. (2005). Low cost experiments in Cognitive Robotics for planning in hostile environments with incomplete information. In *Proceedings of the 11th Conference of the Spanish Association for Artificial Intelligence (CAEPIA'05)*, volume 2, pages 131–140, Santiago de Compostela, Galicia, Spain. Asociación Española para la Inteligencia Artificial (AEPIA).

Trevizan, F. W. and de Barros, L. N. (2005). Robótica Cognitiva: uma aplicação de planejamento com informação incompleta. In *Proceedings of the 7th Simpósio Brasileiro de Automação Inteligente (SBAI'05)*, São Luís, MA, Brazil.

Refereed Workshop Papers

Trevizan, F. W. and Veloso, M. M. (2010). Learning Opponent's Strategies in the RoboCup Small-Size League. In *Proceedings of AAMAS'10 Workshop on Agents in Real-time and Dynamic Environments*.

Trevizan, F. W., Cozman, F. G., and de Barros, L. N. (2008). Mixed Probabilistic and Nondeterministic Factored Planning through Markov Decision Processes with Set-valued Transitions. In *Proceedings of ICAPS'08 Workshop on A Reality Check for Planning and Scheduling Under Uncertainty*.

Research Projects

Short-Sighted Planning under Uncertainty (2010-2013)
Development of new algorithms to solve planning under uncertainty problems that are able to scale up while still offering formal guarantees with respect to the obtained solutions such as optimality and replanning frequency. In order to develop such algorithms, we introduce short-sighted probabilistic planning, a novel approach to effectively solve planning and execution of probabilistic problems. This approach incrementally generates short-sighted subproblems by limiting the probabilistic planning state space and elsewhere heuristically aiming at the set of goals.

Learning Opponent's Strategies in the RoboCup Small-Size League (2009-2010)
Proposed a similarity function to compare two teams, and consequently their strategies, by the ability of one team to mimic the behavior of the other. Used the proposed function to classify

opponents as well as to decompose an unknown opponent as a combination of known opponents. This approach was applied in real world data from the RoboCup Small Size League collected during the RoboCup 2007, RoboCup 2008 and USOpen 2009 to classify opponent's defense strategies.

An Unified Model for Planning under Uncertainty (2004-2006)
Investigation of decision-theoretic planning models under risk, Knightian uncertainty and the continuum between them. Development of an unified planning model to represent any problem in this continuum, in which the extremes are nondeterministic planning and probabilistic planning.

Cognitive Robotics: an application of planning with incomplete information (2003-2004)
Development of a software and a robotic agent to solve a search and rescue problem through planning and the concepts of Cognitive Robotics: to program agents using explicitly only high-level actions and relations among actions characterized as formal logical statements.

Fellowships, Honors, and Awards

2016, Best Paper Award at 26th International Conference on Automated Planning and Scheduling (ICAPS).

2013–2014, Postdoctoral Fellowship from the São Paulo State Research Foundation (FAPESP).

2007–2013, Scholarship from Carnegie Mellon University (CMU) for Doctorate degree.

2006, Fellowship from the Brazilian Coordination for the Improvement of Higher Level Personnel (CAPES) for Doctorate degree.

2006, Best Paper Award (Premio José Negrete) at 2nd International Joint Conference: 10th Ibero-American Conference on AI (IBERAMIA), 18th Brazilian AI Symposium (SBIA).

2005–2006, Fellowship from the Brazilian National Council for Scientific and Technological Development (CNPq) for Masters degree.

2003–2004, Research Experience for Undergraduates (REU) Fellowship from the São Paulo State Research Foundation (FAPESP).

Teaching

Teaching Assistant, Graduate Artificial Intelligence, Carnegie Mellon University, Spring 2012.

Teaching Assistant, Probabilistic Graphical Models, Carnegie Mellon University, Fall 2010.

Teaching Assistant, Undergraduate Introduction to Computer Science, University of São Paulo University, Spring 2006.

Instructor, Basic informatics course, Mahatma Gandhi NGO, São Paulo, Brazil, 2002 – 2003.

Professional Experience

Google Seattle-Kirkland (2011)
Developed a new feature selection algorithm based on approximations of conditional mutual information between sets of features. The algorithm was implemented using MapReduce and tested in large scale sparse datasets (approximately 10^6 instances with 10^8 features).

Google Pittsburgh (2010)
Developed a new regularization algorithm for one of Google's multipurpose machine learning system. The algorithm performs regularization by dynamically changing its learning rate.